VASAVI COLLEGE OF ENGINEERING (Autonomous)
IBRAHIMBAGH, HYDERABAD – 500 031

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

PRINCIPLES OF DATA STRUCTURES
(OPEN ELECTIVE-III)
SYLLABUS FOR B.E. V SEMESTER

L : T : P(Hrs./week): 3	SEE Marks:60	Course Code: U19OE510CS
Credits: 3	CIE Marks :40	Duration of SEE: 3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
Objectives of this course are to:	At the end of the course, students will be able to:
1. Understand Basic linear and non-linear data structures and learn techniques of recursion 2. Understand concepts of Linked lists 3. Understand Concepts of Stacks and queues 4. Understand Concepts of Trees 5. Understand Concepts of Graphs and different sorting and searching techniques and their complexities.	1. Understand the basic concepts of data structures. 2. Understand the notations used to analyze the performance of algorithms. 3. Choose and apply an appropriate data structure for a specified application. 4. Understand the concepts of recursion and its applications in problem solving. 5. Demonstrate a thorough understanding of searching and sorting algorithms.

UNIT-I
Introduction: Data Types, Data structures, Types of Data Structures, Operations, ADTs, Algorithms, Comparison of Algorithms, Complexity, Time- space tradeoff.
Recursion: Introduction, format of recursive functions, recursion Vs. Iteration, examples.

UNIT-II
Linked Lists: Introduction, Linked lists and types, Representation of linked list, operations on linked list, Comparison of Linked Lists with Arrays and Dynamic Arrays.

UNIT-III
Stacks and Queues: Introduction to stacks, applications of stacks, implementation, and comparison of stack implementations. Introduction to queues, applicationsof queues and implementations, Priority Queues and applications.

UNIT-IV
Trees: Definitions and Concepts, Operations on Binary Trees, Representation of binary tree, Conversion of General Trees to Binary Trees, Representations ofTrees, Tree Traversals, Binary search Tree.

UNIT-V
Searching and Sorting: Linear searching, binary Searching, sorting algorithms: bubble sort, selection sort, quick sort, merge sort.

Textbooks:
1. Narasimha Karumanchi, "Data Structures and Algorithms MadeEasy", Career Monk Publications, 2017
2. Horowitz E, Sahni S., and Susan Anderson-Freed," Fundamentals ofData structures in C", Silicon Pr; 2 edition (1 August 2007)
3. ReemaThareja, "Data Structures using C", Oxford, 2014.

Reference Books:
1. Kushwaha D. S. and Misra A. K, "Data structures A ProgrammingApproach with C", PHI.
2. Seymour Lipschutz," Data Structures with C", McGraw Hill Education,2017.

Learning Resources:
1. https://www.tutorialspoint.com/data_structures_algorithms/index.htm
2. https://www.edx.org/course/foundations-of-data-structures
3. https://sites.google.com/site/merasemester/data-structures

The break-up of CIE: Internal Tests   + Assignments + Quizzes

1	No. of Internal Tests	:	3	Max. Marks for each Internal Test	:	30
2	No. of Assignments	:	3	Max. Marks for each Assignment	:	5
3	No. of Quizzes	:	3	Max. Marks for each Quiz Test	:	5

Duration of Internal Tests   : 90 Minutes